LAMOS SCIENTIFIC LABORATORY UNIVERSITY OF CALIFORNIA OS ALAMOS, NEW MEXICO 87544 TELEPHONE: A 58-062 3-4

TO : W. E. Ogle, J-DO

UNIQUE DOCUMENT #SAC200112570000

FROM : H. Hoerlin, J-DO

SUBJECT: EYEBURN FOR SEVERAL YIELDS - THERMAL AND OVERPRESSURE DATA

SYMBOL : JOR-72-16

ROUGH DRAFT

DATE: May 8, 1972

CLUS DOCUMENT CONSUTS OF 4 PACEOSI

I have made a series of eyeburn calculations using as inputs the measured outputs from 4 Dominic events (Derksen, NOL-TR-72-42), assuming slant distances of 20, 40 and 80 nm, target at 40,000 ft altitude, dark and light adapted eye. The safe dosages are taken from IA-4651, by J. Zinn, Figure 8; these thresholds are a bit lower (more conservative) than those proposed during a post Dominic eyeburn meeting held in Los Alamos in 1965. Air transmission was taken with $\beta = 0.025/\text{km}$, corresponding to a visibility better than "very clear" ($\beta = 0.06/\text{km}$) and not quite "exceptionally clear" ($\beta = 0.014/\text{km}$). The conclusions are listed in Tables I and II; they are conservative. Various assumptions were made, the worst case assumes a 150 msec blink at second max. A more detailed memo will be submitted shortly. Thermal and overpressure data are shown in Table III.

Distribution:

Cy. 1RD - W. E. Ogle, J-DO 2RD - D. M. Kerr, J-10 3RD - J. S. Malik, J-DO 4RD - H. Hoerlin, J-DO This matrice contribute of a factor of a factor is the second state of a factor of the second state with a factor of a factor of the second state franchiston or revelation of which in any manner to an unauthorized person is prohibited by law,

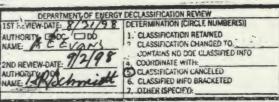
DOWNOR (DDNG AND

DECLASSIFICATION.

GROUP 1



CE



975A20000104

THT-72-233

ESCLIPTED FROM AUTOMATIC

May 8, 1972

2

TABLE I

A. NIGHT ADAPTED EYE

-16

Tanana,	2.3 kt, just about safe at 40 mm
Nambe,	43 kt, not safe at 40 nm safe at 80 nm
Harlem,	1.1 Mt, not safe at 40 nm near threshold at 80 nm
Үево,	3.1 Mt, not safe at 40 nm near threshold at 80 nm

B. LIGHT ADAPTED EYE

Tanana, just about safe at 20 nm

Nambe, not safe at 20 nm, but near threshold. Safe at larger distances.

Harlem, not safe at 20 nm, just above threshold at 40 nm

Yeso, similar to Harlem



-2-

-

1



-3-

May 8, 1972

1-72-16

TABLE II HARLEM, 1100 kt

tlmax = 1.7 msec t_{min} = 95 ms t_{2max} ~ 1 sec

Aircraft at 40,000 ft

		Dose	cal/cm	2
-	Image diam. microns	night	day	safe
	100	.6	.1	.1
		1.3	.2	.1
		.3	.04	.4
			.6	.4
50 - 1000				.1
0 - 2	50			.1
0 - 10	75			.7
0 - 150	250			
	450	2.4		.5
-	25	.2	.03	.2
		.3	.05	.4
		.1	.02	1.5
0 - 150			.15	.7
850 - 1000	225	•7		
	50 - 1000 0 - 2	msec microns $0 - 2$ 100 $0 - 10$ 150 $0 - 150$ 500 $50 - 1000$ 900 $0 - 2$ 50 $0 - 10$ 75 $0 - 150$ 250 $550 - 1000$ 450 $0 - 2$ 25 $0 - 10$ 450 $0 - 2$ 25 $0 - 10$ 40 $0 - 150$ 125	Pulseimage diam.nightmsecmicronsnight $0 - 2$ 100.6 $0 - 10$ 1501.3 $0 - 150$ 500.3 $50 - 1000$ 9004.0 $0 - 2$ 50.4 $0 - 10$ 75.8 $0 - 150$ 250.2 $50 - 1000$ 4502.4 $0 - 2$ 25.2 $0 - 10$ 40.3 $0 - 150$ 125.1	msec microns hight unity $0 - 2$ 100 .6 .1 $0 - 10$ 150 1.3 .2 $0 - 150$ 500 .3 .04 $50 - 1000$ 900 4.0 .6 $0 - 2$ 50 .4 .07 $0 - 10$ 75 .8 .1 $0 - 150$ 250 .2 .03 $0 - 150$ 250 2.4 .4 $0 - 2$ 25 .2 .03 $0 - 150$ 40 .3 .05 $0 - 10$ 40 .3 .05 $0 - 10$ 125 .1 .02 $0 - 150$ 125 .1 .02

SOIL

27

May 8, 1972

TABLE III

THERMAL, OVER PRESSURE AND SHOCK ARRIVAL PREDICTIONS Source: 1.2, 3 and 20 Mt at ~ 500 m above sea level Aircraft (target) at 40,000 ft and 10,000 ft altitude Slant distance: 20 nautical miles

	1.2 Mt	<u>3 Mt</u>	20 Mt
Prompt thermal, cal/cm ² , max. 40,000 ft 10,000 ft	2.1 1.8	5 4.5	35 30
10,000 ft Prompt thermal, cal/cm ² , probable 40,000 ft 10,000 ft	1 .8	2.5	17 14
Allowable dose Sure safe Mission complete	4.2 30	5.7 42	6.9 57
Overpressure, * psi 40,000 ft 10,000 ft	.1 .21	.15 .3	.35 .7
Shock arrival, sec 40,000 ft 10,000 ft	111 100	106 99	97 95

*Overpressure criteria for EC-135

.54 to 1.18 psi buckling of lower skin panel, but safe 2.1 psi radone failure 2.68 psi sure kill mover demage but safe

FF